eatment of Cancer of the Rectum, with a Report of Twenty-five Cases.

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TREATMENT OF CANCER OF THE RECTUM, WITH A REPORT OF TWENTY-FIVE CASES.

By W. W. Keen, M.D., LL.D.

If you will pardon me for alluding to the diagnosis in a paper professedly considering only treatment, there are two points so important that I wish to say a very few words in reference to them. First, the disease often escapes the attention of the family physician simply because he fails to make an examination. Not long since I saw a gentleman with a very distinct cancer of the descending colon, discovered the moment that the hand touched the abdominal wall, yet it had been entirely overlooked by his physician simply because he had never examined the abdomen. One of the cases reported below had had positive symptoms of cancer of the rectum, including bloody stools, for two years, and yet his physician had never once made a rectal touch.

The second point is that in the digestive tract cancer is not necessarily confined to late middle life or old age. We are so accustomed to take cancer of the breast as a type, in which organ cancer before the age of forty is rare, that we are in danger of considering the same rule as applying to other parts of the body. But in the digestive tract I

have known several cases occurring before thirty, and recently Czerny (*Münch. Med. Woch.*, 1896, No. 11) has reported one case in a little girl of thirteen.

Turning now to the treatment of cancer of the rectum, this is divided into the *palliative* and the *radical*. The cases suited to palliative treatment are those in which the extent of the disease is too great to allow of radical treatment or the condition of the patient is such as to forbid extirpation of the disease. By the "extent of the disease," I do not mean chiefly the amount of the rectum involved, for that is only occasionally too great to allow of radical treatment. Whether the radical treatment can be done or not depends far more on the involvement of neighboring organs. If the bladder or the prostate in the male, or the posterior wall of the vagina and the lower part of the uterus in the female, are extensively involved in the disease, it will rarely be possible to effect a cure or even to obtain recovery after the radical treatment. Yet in one case operated upon by my colleague, Professor Montgomery, in which the entire posterior wall of the vagina and the lower part of the uterus were involved, he was able not only to remove the rectum, but also at the same time the uterus, ovaries, and the posterior wall of the vagina, and obtain a most satisfactory cure. Parts of the prostate and of the bladder in the male have also been removed with success, but ordinarily this cannot be hoped for. Usually cases in which these organs are involved would be best subjected to palliative treatment only.

The Palliative Treatment.—This consists in colostomy, in order to allow the feces to escape from an artificial anus and to avoid the damming up of the feces in the upper rectum and the colon, or, if there be not much obstruction, to avoid the passage of the feces over the ulcerated surface of the rectum. Either of these conditions, if not relieved, is productive of excessive pain and exhaustion, and, in the case of ulceration, there may be serious repeated hemorrhages.

Formerly our only resource was a lumbar colostomy. In my experience that is a most ineffectual operation. It is very difficult to produce an effective spur between the upper and lower parts of the opening which will deflect all of the feces through the artificial anus. Almost invariably a small, and in some cases a very considerable, portion of the fecal material, instead of escaping from the artificial anus, continues its course into the bowel below the opening, making the artificial anus therefore to that extent useless. The only reason in former times for doing a lumbar colostomy was that we could operate without opening the peritoneum, a danger of the most serious character in pre-antiseptic days. Since, however, we have learned to deal with the peritoneum fearlessly by modern methods, there is no reason why lumbar colostomy should still be practiced. Besides, in some cases, the colon cannot be found, and the small intestine has been opened by error. I remember very vividly one case (No. XVII)—in which I did a lumbar colostomy about ten years ago—in which, to gain access to the colon, I was obliged to open the peri-

toneum and was in the greatest possible doubt for a considerable time as to which one of the two coils of intestine was the colon. I decided, fortunately, at last upon the right one. Had I opened the other, I should have created the artificial anus in the small intestine, which would have led to speedy death by inanition. From that time to the present, excepting in one case (No. XVIII), I have invariably done an inguinal colostomy, and for some years by Maydl's method.

As this method may not be familiar to all of you, I will briefly describe it. If we have reason to believe that the cancer has not extended so far up as to interfere with, or that within a reasonable time it will involve the opening to be made in, the bowel, the operation is done in the left inguinal region. If the cancer has invaded the sigmoid flexure, then the artificial anus is made in the right inguinal region, or if circumstances make it desirable, in the transverse colon.

An oblique incision is made in the left inguinal region, the centre of which lies just above the anterior superior spine of the ilium. The peritoneum having been opened, the finger is swept from the opening externally and then posteriorly along the belly wall, when, as pointed out by J. Chalmers Da Costa (*Medical News*, June 9, 1894, p. 634), the first coil of intestine met with must necessarily be the colon. If this maneuver be followed very little difficulty will be experienced in finding the colon. Ordinarily even this is unnecessary, for the colon will present itself at the wound or be found by the finger the

moment it enters the abdominal cavity. A loop of colon is then drawn out through the wound, and the upper colon is drawn down until all the slack is taken up. The object of this procedure is twofold: First, if the operation be a merely palliative one, by drawing down all of the slack we can to a great extent prevent or lessen the amount of subsequent prolapse of the bowel; secondly, if the radical operation is done later there will be less difficulty in drawing down the stump of the bowel. With a pair of hemostatic forceps the mesentery is perforated and a glass or other disinfected bar is passed through the opening. The bowel is now secured to the belly wall at the upper and lower ends of the incision by a transverse suture, so as to prevent any hernia resulting from efforts at vomiting, and the wound is then closed, excepting the central part where the loop of bowel protrudes. Sometimes I have sewed the parietal peritoneum to the skin so as to bring a large surface of peritoneum instead of the cut edges of the belly wall in contact with the bowel, and thus secure an earlier adhesion. How early this takes place is well illustrated in Case II. Five hours after the Maydl operation was completed, the patient complained of a great deal of pain from flatus owing to too sharp a kink of the colon over the glass bar, as I had not allowed quite sufficient slack of the bowel over that obstacle. Accordingly, as I had not in that case secured the bowel by any sutures, I seized the bowel with the finger and attempted to draw the upper portion down to a slight extent. The adhesions already existing be-

tween the intestine and the belly wall were so strong that it required considerable effort to loosen the bowel.

Instead of the glass bar which I ordinarily use, I have on two occasions passed a rope of iodoform gauze through the opening and secured it to the skin on each side by a stitch, so as to keep it taut. This answered the purpose perfectly. Another expedient I have also tried on two occasions with satisfaction (Cases XXI and XXII) is that suggested by Bidwell (*Lancet*, 1895, i, 753). Instead of the bar or rope one or two stitches are passed through the opening in the mesentery, and by means of the stitches the margins of the skin on each side are sewed together under the loop of bowel, the skin thus replacing the bar or gauze rope. Should the necessity for immediate opening of the bowel exist, as in the case of a child with an imperforate rectum, upon whom I operated forty-five hours after birth, the bowel is then sutured all around to the skin by either an interrupted or better a continuous silk suture, when it may be opened fearlessly at once.

In dressing such a case, I soon found one little difficulty. If the gauze dressing is placed directly on the intestine, in a very short time after the operation the gauze becomes adherent to the bowel and is removed with some difficulty. To avoid this a small piece of disinfected rubber dam or oiled silk is placed over the bowel, and no such adhesions then take place If the bowel is not to be opened at once, I have usually waited till the second or third or even till the fourth day, and then opened it either in the axis of

the bowel or transversely, according to the need. If it is the intention that the opening in the colon shall only be temporary, the incision should be made longitudinally, so that it may be closed at a later operation. If the opening is intended to be permanent it is best to make a transverse incision; either then or later this is carried all the way down to the bar, rope, or skin, whichever method is employed, so as to cut the bowel entirely through. Usually one or more small vessels in the mesentery will spurt; these can be seized with hemostatic forceps and tied with silk. If there is any redundant bowel protruding, it may be resected to the level of the skin. All of this can be done without an anesthetic, as it causes little or no pain.

The ultimate result of a Maydl operation is most satisfactory. The patient can defecate either in the standing position or lying on the side. Usually a single or at most two movements of the bowels occur in the twenty-four hours, and meantime the patient is able to go about and attend to his ordinary occupations without the slightest inconvenience; no odor is perceptible, and the patient can enter into an active business and social life with perfect security. In Cases II and III this is notably the case. If diarrhea occurs, then there is apt to be trouble, and the patient is obliged either to remain indoors or to dress the wound much more frequently.

The mode of dressing such a wound is best described in the two cases just referred to. Some protrusion of the bowel occurs occasionally, but not to such an extent as to become a serious annoyance.

The advantages of a Maydl operation as a preliminary to the radical operation will be referred to later on.

Patients who are not amenable to a radical operation, and in whom the colostomy is done merely for palliation, are rendered very much more comfortable and life becomes far more bearable. Its danger is very slight and its advantages very great. Incontinence being the exception rather than the rule, they can adjust their lives very readily to the varied conditions in which they find themselves. So comfortable have been several of my patients that they have been unwilling to submit themselves to a second operation for the closure of the artificial anus, being persuaded that they are more comfortable with the anus in a position where they can dress it personally than if they were to have an artificial anus at the end of the spine.

The Radical Treatment.—Until a few years ago no case was deemed suitable for radical operation unless the growth was within reach of the finger and was so limited as to require the removal of only a small portion of the rectum. This was still the prevailing opinion among the English surgeons so late as 1889. Mr. Allingham deprecated the removal of any growth, even four inches up the bowel, as unscientific and unsurgical, and Mr. Treves in his "Operative Surgery" states that the cases suited to excision are "comparatively few in number," and that "very rarely does the excised portion measure more than three inches in length. In no case should the peritoneum be deliberately opened." My own and many other reported cases show that

these are by far too conservative views. We owe the extension of the modern radical treatment of cancer of the rectum chiefly to the enterprise and audacity of German surgeons. American and later English opinion (Ball, in Treves' "System of Surgery," ii, 787) seems to have recently undergone a rapid change in the direction of far more radical interference, so that it is now not uncommon to see cases reported in which six or eight or even ten and twelve inches of the rectum (Purcell, *Lancet*, 1896, i, 725) have been removed. Several of my cases illustrate extensive resections of six to nine and a half inches; in fact, these cases are more than a resection of the rectum; they involve a considerable portion of the sigmoid flexure of the colon. It may be stated, as a general rule, that all portions of the rectum and colon are now amenable to the radical treatment, if other conditions are not such as to forbid it. Those that are too low down to be reached by a celiotomy can be reached by the sacral method, and those too high up for the sacral method can be attacked by celiotomy. In fact the entire alimentary canal, except a portion of the esophagus, is now accessible to the surgeon.

The radical treatment may be considered under two headings: first, the preliminary treatment; second, the actual resection or amputation of the rectum.*

In the preliminary treatment the rectum

* Resection is the removal of a part of the rectum in its continuity, the anal portion being left. Amputation is the removal of the lower end of the rectum, including the anus.

must be thoroughly unloaded of its contents in all cases, which, if there is any obstruction of the bowel, are very considerable and may be enormous. Ordinarily surgeons lay down the rule that several days, amounting to a week or ten days in the opinion of some, are necessary for this preparation. My own experience leads me to believe that a much longer time is necessary to unload the bowels in the case of serious obstruction. For instance, in Case I a week was employed in unloading the rectum, and I supposed that it was reasonably empty, yet at the operation the field of operation and the towels and sheets around the patient were flooded with a continuous stream of fecal matter, which poured out for such a length of time that I was unwilling to prolong the cleansing of the bowel and terminated the operation without having effected a complete evacuation of the colon. In Case V seventeen days were employed in daily efforts, by moderate laxatives and repeated enemas, to cleanse the bowel, and yet it was found loaded with feces above the obstruction. The same condition has been found at operations by Schwartz after three weeks' preliminary attempts at complete evacuation, and by Kraske after a month. The accumulation has been so great that I have been compelled to believe that in some cases almost the entire colon was filled with fecal matter due to the obstruction. If such difficulty exists in emptying the bowel, how much more difficult will it be to disinfect it!

Whether a preliminary colostomy shall be done or not will depend chiefly on the amount

of bowel to be removed. If we have good reason to believe that the cancer does not extend so high as to require the opening of the peritoneum, I should then be perfectly willing to forego a colostomy and trust to repeated efforts at unloading the bowel by moderate laxatives, covering not less than one week, and if necessary two or three. In administering these it is very necessary, however, to be watchful of the strength of the patients. They are usually persons who have been very much exhausted by the continued pain and obstruction, and more or less by the auto-infection which has taken place, and if they are further weakened by active purgation they will be rendered unable to endure the operation. Usually, however, in cases where the cancer is low down, involving the third part of the rectum, this preliminary cleansing is sufficient without colostomy.

The great danger of all resections or amputations of the bowel, excluding primary shock and hemorrhage, is *infection.* If the peritoneum be not opened this danger is minimized, so that even should the wound become infected it will cause a local suppuration, but not peritonitis; hence this confessedly often imperfect method of cleansing the bowel may be sufficient in such cases. If, however, the cancer is situated more than three inches, or especially if more than four inches, above the anus, it is practically certain that the peritoneal cavity must be invaded. (Yet in Cases X and XIII I removed four and five inches without opening the peritoneum.) In all such cases I am, therefore, decidedly in favor of doing a prelimi-

nary colostomy for three reasons: first, it will greatly improve the general health; secondly, it will relieve the obstruction and consequently the pain; and thirdly, it enables us to disinfect the bowel far better than without a colostomy. By means of a catheter introduced into the inferior opening of the Maydl operation, the lower rectum can be washed out from above and the bowel not only cleansed of its fecal contents, but also to a large extent, though never completely, disinfected by a boric acid solution or a very weak bichloride solution, followed by a copious washing out with boiled water. But what is much more important, the contents of the bowel being deflected through the artificial anus, any later infection from soiling by feces is prevented. In women the vagina also should be well disinfected.

In resection or amputation of the rectum, if the anal portion and the anus itself is involved, then the rectum must be *amputated* at a point at least an inch above the growth. If an inch and a half or two inches above the anus are free, then it may be best to do a *resection* of the diseased portion and in some cases to reestablish the continuity of the bowel by methods to be discussed shortly.

The mode of access to the bowel has been entirely revolutionized by the efforts of Kocher, Kraske, and their followers. The old operation through the perineum only allowed us to remove growths at or but little above the anus, but did not allow us to attack growths which were beyond or just within reach of the finger. Kocher took the first step toward the modern operation by

the removal of the coccyx in 1874. This method was employed in Cases VIII and IX. In 1885 Kraske (*Arch. für Klin. Chir.*, xxxiii, 563) practiced a more radical operation by removing not only the coccyx but by chiseling off an oblique portion of the sacrum from opposite the left third sacral foramen to the lower left border. Since then his followers have increased the extent of the resection step by step, until Rose has even resected the sacrum transversely at its junction with the ilium. So extensive a resection of the sacrum, however, does not seem to be either necessary or desirable. A resection up to the third sacral foramen, being careful not to injure the third sacral nerve, should be the limit of operative interference with the bone, since if the third nerve is injured the innervation of the bladder is apt to suffer and incontinence of urine may result. I have never gone beyond that point, but have in several cases resected the sacrum transversely at that level, and have never seen the slightest trouble either from interference with the innervation of the bladder or trouble within the spinal canal itself, though in Cases II and V it was recognized that the spinal canal was opened. Not only can the rectum and part of the sigmoid flexure of the colon be resected through such an opening, but repeatedly the uterus and ovaries have been removed through the same opening.

I have always employed ether as the preferable general anesthetic, but in Cases XXII and XXIII I employed Schleich's fluid very successfully as a local anesthetic.

The operation is done as follows: The pa-

tient lies upon his side, whether upon the left or the right is, I think, a matter rather of the preference of the operator than otherwise. Those who are right-handed will, as a rule, find it more convenient to have the patient lie upon the right side. An incision is made from the posterior inferior spine of the ilium, curving toward the coccyx; it is then prolonged in the middle line nearly to the anus. If it is necessary to remove the lower part of the rectum, including the anus, then from the end of this incision two elliptical incisions are carried around the anus, one upon each side. If, however, the anal portion is to be preserved, the incision terminates just behind the anal aperture. Sometimes I have found it desirable at the upper end to make an incision toward the right side in order to free the right side of the sacrum. The incision is carried directly to the bone, and the soft parts are rapidly dissected away from the bone till the edge of the sacrum and the sacro-sciatic ligaments are reached. These are divided and the soft parts separated from the left side of the coccyx and sacrum. The hemorrhage is apt to be quite free, but is arrested either by hemostatic forceps or by pressure with gauze sponges aided by hot water if necessary. But I usually waste little time on the hemorrhage until the soft parts are completely divided from the edge of the bones. Then the hemorrhage is arrested. The soft parts are then divided upon the other side of the sacrum and coccyx. With the finger, the Allis dissector, and a pair of blunt scissors curved on the flat, we now loosen the rectum from the anterior surface

of the sacrum and coccyx, the tissues not readily loosened being cut either with the knife or the scissors. The hemostatic forceps or sponge pressure is then again required to arrest the hemorrhage. Commonly I pack with gauze sponges, and while the hemorrhage is being checked proceed to the resection of the sacrum. The middle sacral artery will require ligation. I do not usually chisel the sacrum as recommended by Kraske and others, but with a large pair of bone forceps I divide the sacrum transversely at the fourth sacral foramen if it is pretty clear that this will be high enough, or I resect directly at the third foramen. Occasionally when I have divided the bone at the fourth I have found it necessary later to take off a second piece with the forceps. Not uncommonly, as soon as the bone is resected, free hemorrhage takes place from its cut surface. Sometimes the vessels can be crushed between the jaws of the hemostatic forceps, but in any case in which the hemorrhage is troublesome, Horsley's putty will immediately arrest it.

Having laid bare the posterior portion of the rectum, we now proceed entirely to isolate it, first upon one side and then upon the other. This is best done by the finger or by blunt dissection. The inferior mesenteric arteries, one on each side, require careful ligation, as they are large vessels. Having separated it upon the two sides it must next be separated from the structures in front of it. Here considerable care must be used, especially in the male. In Cases III, V, and XIII, for instance, when this separation was effected, the bulbous portion of the corpus

spongiosum, the membranous urethra, the prostate and a portion of the bladder were all in sight. In order to avoid danger, especially to the urethra, it is generally wise to insert a bougie in order to warn us of the near presence of the urethra, prostate, and bladder; this is particularly needful if the adhesions of the growth are at all marked. In women the connective tissue between the rectum and the vagina enables us to separate the rectum from the posterior wall of the vagina with relative ease if it be not involved, but very often the growth has involved this tissue and may make the rectum very adherent to the vagina. As already stated, if the wall of the vagina itself is extensively involved, as a general rule it would seem wiser to forego any operation—a rule, however, which the case of Montgomery proves not to be absolute. If the vagina be only moderately involved, as in Case VI, a V-shaped portion, including all the diseased tissue, should be removed and the incision closed by sutures.

Having isolated the rectum at the lower portion, it must be freed upward beyond the growth. Traction will bring a large portion and perhaps the whole growth well into view. In freeing the rectum higher up, care must be taken in two directions: first, that the meso-rectum, when we reach it, shall be divided in such a way as not to interfere with the vascular supply lest the stump should undergo necrosis; second, especially upon the two sides and in front the danger exists of opening the peritoneum. If this can be avoided it is far better to do so, as it diminishes greatly the danger of septic peritonitis.

If the growth extends high up, however, it will be necessary to open the peritoneum, and this should then be done purposely. Once it has been opened the bowel should be drawn down far enough to clear the growth by at least an inch and a half or two inches. As soon as the rectum is drawn down to this extent the opening in the peritoneum should be immediately closed by suturing its border to the anterior surface of the rectum. This brings peritoneum in contact with peritoneum and insures an almost immediate closure of the opening in the peritoneum, and so avoids a septic peritonitis. Careful search should now be made for any glands which may be diseased. They lie posterior to the rectum. Every gland which is discovered should be removed.

In all the manipulations to this time it is of great importance if possible not to have opened the rectum. Sometimes it is so friable from the growth that this cannot be avoided, but where possible it will be easily seen that if we can avoid opening the rectum until after we have closed the peritoneal cavity the danger of septic infection is vastly less. I cannot at all agree with McCosh (*New York Medical Journal*, Sept. 3, 1892), who advises that if the peritoneal cavity has been opened, no attempt be made to close it, but that we shall rely upon packing with iodoform gauze. Suturing as I have described it can be done easily and accurately, and it will protect the peritoneal cavity from a possibly fatal infection far better than by packing with iodoform gauze. The bowel is now divided at a point at least an inch above the growth, the

stump being seized with hemostatic forceps, which can be placed at points which will control the arteries, of which there are usually several that bleed. The diseased portion of the rectum is then drawn out and either the entire lower part is amputated or such portion of it is resected as is necessary. If it is perfectly clear from the beginning that an amputation rather than a resection of the rectum must be done, then it is desirable, I think, to begin from the anal end and work upward. Whether we shall work upward or downward will depend upon the exigencies of each case. Campenom (*Centralblatt für Chirurgie*, 1895, 272), Rehn (*Wiener klin. Woch.*, 1894, 249), Byford (*Annals of Surgery*, November, 1896, 631), and Bristow (*Medical News*, Dec. 5, 1896) have also attacked the cancerous rectum through the vagina. Maunsell of Australia (*American Journal of the Medical Sciences*, March, 1892, 245) proposed a new and ingenious method of intestinal anastomosis by invagination through a temporary opening which has been applied to the upper rectum by Hartley (*New York Medical Journal*, Oct. 22, 1892, 464), of which the simple model I show you will give a clear idea. It is only applicable to a few cases of limited growths high up in the rectum or in the adjacent sigmoid flexure, but is there a most valuable method.

As an addendum to the consideration of Kraske's operation for cancer, I may add that it has been utilized in syphilitic stricture of the rectum by Herczl (*Annals of Surgery*, September, 1892, 267) and lately by Higgins (*Boston Medical and Surgical Journal*, May

14, 1896, 485), Elliot (*Medical News*, Oct. 17, 1896, 436), and a few days ago by myself in operating for imperforate rectum.

Temporary Resection.—The methods spoken of thus far have all comprehended the entire removal of a portion of the sacrum and all of the coccyx. A half-dozen different methods have been devised by which the sacrum and coccyx are divided longitudinally, transversely, or obliquely, without separating the flaps of skin from the bone. In other words, an osteoplastic resection, such as we often do in the skull, is made. The advantages claimed for this method are: first, that it restores the integrity of the bones; second, that in women who are operated on before the termination of their child-bearing period the integrity of the pelvic planes is restored by not disturbing the sacro-sciatic ligaments. Sieur (*Arch. Prov. de Chir.*, June, 1896, 333) states that there is but a single case reported (Lihotsky, published by Hochenegg, *Wiener klin. Woch.*, 1889, No. 30) of a woman successfully giving birth to a child after such an operation. Morenstein (quoted by Gerster, *Transactions of the American Surgical Association*, 1895, xiii, 93) narrates, however, a second in which, while the parturition was normal, the woman died of infection from a sacral fistula through the hand of the accoucheur. The birth being normal in both cases, this object seems to me to be of very small moment. I cannot see also the importance or necessity of replacing the temporarily removed sacrum and coccyx. In all the cases in which I have operated that have survived, there has not been a single complaint of inconvenience from the loss of

the coccyx and part of the sacrum. Indeed in Case II the restoration to function of the perineum and bones of the pelvis is such that he rides a bicycle, and in Case III the same diversion has been begun, four years after the operation. I cannot, therefore, think that it is important that the bones should be replaced, and it certainly adds to the danger. Union of the bones is not by any means so readily obtained as union of the soft parts, and if the replaced bone becomes infected or necrotic, it adds not a little in my opinion to the danger. I have, therefore, always removed the bone entirely.

Treatment of the Bowel after Amputation.— If the lower end of the rectum has been amputated the only question is, What shall be done with the upper end? I have in most instances simply attached it to the lower end of the resected spine. If no artificial anus has been made, it is essential that the resected end shall fulfil hereafter the function of the anus. We can almost always bring it down to the end of the spine, and I have never had any difficulty in attaching it there. The objection, of course, to this method is that there being no sphincter, the patient has no control over his motions. This is by no means always the case, though unfortunately it is apt to be one of the disagreeable sequels of such an amputation. To avoid this absence of sphincter Gersuny (*Centralblatt für Chirurgie*, 1893, No. 26) proposed that the end of the bowel should be seized by two forceps and twisted a half or even a whole revolution so as to make an artificial sphincter by the twist. I have twice resorted to

this method (Cases VIII and XIII) and have regretted it in each instance. I have not been able to secure the twisted and puckered end of the bowel to the adjacent soft parts so that infection did not take place between the sutures; and though the patients recovered, yet practically the method was worth nothing, or rather was worse than worthless, since it led to the infection Gerster, Marcy and others, however, have had more success and approve of the method. Willems (*Centralblatt für Chirurgie*, 1893, No. 19) has tried to meet the difficulty in another way by carrying the end of the bowel through the fibres of the great gluteal muscle just as in a gastrostomy we utilize the fibres of the rectus so as to make them serve as a sphincter. I have never tried this method.

In case an artificial anus has been made in the colon as a preliminary operation to the radical extirpation, in thinking over the matter I am inclined in my next case to close the lower end of the bowel at the point of section, leaving the artificial anus to serve not only for the escape of the feces from above, but also as an outlet for the small amount of mucus that will gather in the rectum below the artificial anus. In fact, in view of the remarkable results obtained by Obalinski, Eiselsberg, Luhrs (*Centralblatt für Chirurgie*, 1896, 809, 830 and 1007) and others from total exclusion or closure of a large part of the bowel about the caput coli, I have contemplated even the possibility of closing both ends of that part of the rectum below the Maydl operation.

Treatment of the Bowel after Resection.— If sufficient of the anal portion of the rectum is healthy it may be preserved, thus preserving the sphincter intact. Though in the majority of cases this will not be possible, yet in a few it may do very well. In that case the attempt should be made if possible to restore the continuity of the bowel so as to obtain the advantage of the normal sphincter. Circular suture of the two ends has been tried repeatedly, but unfortunately fails from tearing out of the stitches owing largely to the amount of traction upon them; and this giving way of the stitches is followed by infection of the wound or by a fecal fistula. The use of Murphy's button for uniting the two ends has been practiced very rarely and not very successfully. I have tried it but twice. In Case I a septic peritonitis carried off my patient as a result of the secondary operation in which I used the button thirteen months after the first operation. In Case XV the button also proved fatal from sloughing of the bowel. Hochenegg (*Wiener klin. Woch.*, 1889, No. 30) has proposed to solve the difficulty in an ingenious way which my colleague, Professor Montgomery, resorted to some time since in a case, but with an unfortunate result. He seizes the upper end, draws it through the anal end, and attaches the upper end to the skin around the anus. To facilitate adhesion of the upper end to the inner surface of the anal portion the latter would best be deprived of its mucous membrane by thorough curetting or by the scissors. The sutures of course always tear out, but before they have torn out the adhesions are sufficiently strong in some

cases to hold the bowel approximately at least in place, and restores the continuity of the lower portion of the digestive tube. If this—which I think is the best solution of the problem—cannot be done, then I prefer to remove the lower portion entirely and attach the end of the rectum to the resected spine or close it as I have above suggested.

The *results* should be considered in three aspects: First, as to immediate mortality; second, as to ultimate cure; third, as to comfort after the operation.

First, *the immediate or primary mortality.*—Sieur (*loc. cit.*) states that the mortality reported by Iversen in 1890 was 57 per cent.; Schede, 25 per cent.; Czerny, 19 per cent.; Albert, 10.9 per cent. Sieur collected in France 95 operations with 37 deaths, a mortality of 38.9 per cent. Of the 37 who died, 11 died from hemorrhage and shock and 18 from septic infection, leaving 8 from other causes.

McCosh in 1892 (*New York Medical Journal*, Sept. 3) collected from seventeen different authors, all German surgeons, excepting Cripps in England (thirty cases) and Kelsey in America (seven cases), a total of 439 cases with 84 deaths, a mortality of 19.1 per cent, which may be taken to represent the average mortality at that time, and probably it is not far from that at present. The mortality of my own cases of extirpation (I–XV) is 20 per cent.

Secondly, *the ultimate cures.*—McCosh collected from one English and nine German surgeons 375 operations, of whom thirty-two were perfectly well at the end of four years, the limit usually assumed as assur-

ing a permanent cure, to which should be added a certain number of the 375 cases which had not yet reached the four-year limit, some of whom undoubtedly would be permanently cured. Eleven or twelve per cent., therefore, at that time was an approximately correct proportion of absolute cures. I believe it will be found much greater as time goes on.

Of my own fifteen extirpations twelve survived, and four have reached or passed the four-year limit, giving a present percentage of 33⅓ per cent. of permanent cures, and Case XIII has nearly reached the three-year limit without return. Case XIV may survive to or beyond the four-year limit. Had Case I not been operated upon the second time he might have been as fortunate. These cases would still further increase the percentage of recoveries. Even where cure is not effected, just as in cancer of the breast, life is very much longer than is the case after a simple colostomy; probably on the average by eighteen months. It must not be forgotten also that in some cases where a relapse has followed, a second or even a third operation has resulted in permanent cure.

Thirdly, *as to comfort after operation.*— As compared with the damming up of the feces, with its alternate diarrhea and constipation and its dreadful pain, incontinence is preferable. Moreover, a large proportion of the patients do not suffer from incontinence, excepting when they have diarrhea, and if an artificial anus is made after Maydl's method, as several of my patients prove, the comfort

is almost absolute. Case II is a gentleman in the first social position, who has traveled along the shores of the Mediterranean and in various social centres of Europe, mingling freely with his friends and acquaintances without many of them even knowing that he has ever had such an operation. He rides a bicycle and is in every respect restored to his normal life.

Case III is another instance of equally perfect restoration to the activities of life. He is a merchant in a neighboring city and comes to Philadelphia in the morning, goes among his business friends making his purchases and attending to his usual business as if nothing had ever happened; and many of his acquaintances also are not aware that he has ever had an operation performed.

The first of these cases is now two months past the four-year limit, the other has just reached the four-year limit.

Case IV, after four years, is hale and hearty and is almost as comfortable as the other two.

Case XI also was able to enjoy an active business life for nearly all of the four years he survived the amputation of the rectum, and died of an intercurrent affection.

Case XIII for two years and ten months has been most comfortable and has no incontinence.

Case I for the year that he lived was able to resume his duties as a clergyman with comfort.

Contraindications to Operation.—I have already referred to the principal contraindications, namely, such extensive adhesions to

neighboring organs and their involvement by the cancerous growth that it would be better simply to do a palliative colostomy, and disease too extensive to allow of removal. Besides these, however, there are other contraindications which should not be forgotten which exist in connection with the general state of the patient—*e.g.*, if the patient is too old or is too feeble to withstand the serious shock of a resection or amputation of the rectum (as in Cases XIX, XXII and XXIII). I have never been able to accomplish the operation in less than an hour and a quarter, and sometimes even two hours. In very rare cases somewhat more time may be required to do it. Such an operation, therefore, is a very serious shock and must not be undertaken in persons of such age or general health that they could not withstand it. The general condition of the organs of the chest and abdomen should be considered. Cases of pulmonary trouble, especially of emphysema and bronchitis, should not be operated on if we can spare a reasonable time for the purpose of relieving them of the pulmonary complications. I need not call attention, I am sure, to the necessity of examining the abdominal organs, especially the kidneys, for evidences of Bright's disease or pyelitis, and also all the abdominal organs for possible secondary deposits of cancer, especially in the liver. In women also the breasts, uterus and ovaries should be examined, for if cancer exists in other organs besides the rectum, no prudent surgeon would think of doing an operation. In case the general health has been broken down by pain, especially the

pain caused by rectal obstruction, a patient whose rectum cannot be operated on to-day can occasionally be put in good condition for a later operation by making an inguinal anus to relieve the discomfort and pain. This relief is sometimes so marked that the patient's appetite, sleep and general health improve astonishingly in the course of a few weeks and make a later operation possible. To illustrate the above remarks the following reports are taken from my case-book:

The mortality of the twenty-five cases recorded below is as follows:

SERIES 1. — EXTIRPATION BY KRASKE'S OR KOCHER'S METHOD.

Case I recovered from the operation, but died from septic infection thirteen months later on attempt to reestablish the continuity of the bowel.

Case II survived the operation four years and two months, and had no recurrence during that time.

Case III survived the operation four years, and had no recurrence.

Case IV survived four years and one month, with no recurrence.

Case V recovered; no later history.

Case VI died from shock thirteen hours after operation.

Case VII died from uremia fifty-six hours after operation.

Case VIII recovered; no later history.

Case IX recovered; no later history.

SERIES 2.—EXTIRPATION BY THE PERINEAL ROUTE.

Case X recovered from operation; no later history.

Case XI died four years later from acute diarrhea; no return up to that time.

Case XII recovered; no later history.

Case XIII has survived for two years and ten months without recurrence.

Case XIV is still living, after ten months.

SERIES 3.—EXTIRPATION BY CELIOTOMY AND USE OF MURPHY'S BUTTON.

Case XV died from sloughing of the bowel on the third day after operation.

SERIES 4.—INOPERABLE CASES IN WHICH LUMBAR COLOSTOMY ONLY WAS DONE.

Case XVI recovered from the operation, but died about two years later.

Case XVII died about one year after operation.

Case XVIII died from acute entero-colitis twenty-four days after operation.

SERIES 5.—INOPERABLE CASES IN WHICH INGUINAL COLOSTOMY (MAYDL'S METHOD) WAS DONE.

Case XIX recovered from operation, but died from exhaustion thirty-one days later.

Case XX also died from exhaustion fifteen days after operation.

Case XXI died on the fifth day from exhaustion.

Case XXII recovered; no later history.

Case XXIII died from gangrene of foot resulting from femoral thrombosis thirty-seven days after operation.

Case XXIV died from exhaustion two months after operation.

Case XXV died from exhaustion after surviving the operation nearly three years.

SUMMARY.

Grouping together the various series, it will be seen that in the first three there were fifteen cases in which the growth was extirpated. Of these fifteen, twelve recovered and three died from shock, uremia and sloughing of the bowel respectively.

Of five of the twelve cases, no later history has been obtainable.

Of the other seven, one is living after four years and two months without recurrence; one is living after four years and one month without recurrence; one is living after four years without recurrence; one lived four years and died without recurrence; one is living after two years and ten months without recurrence; one died thirteen months later from septic infection after a second operation; one is living after ten months without recurrence.

This gives at least 33⅓ per cent. of definite cures (four year limit) in the twelve operative recoveries.

Of Series 4 and 5, the inoperable cases in which a lumbar or an inguinal colostomy was done, there were ten cases, of which nine recovered and one died on the fifth day from exhaustion.

Of the nine who recovered, the ultimate history of eight is known: One lived nearly three years; one lived about two years; one lived about one year; and five died in periods of from fifteen days to two months.

Of the whole twenty-five cases, twenty-one made a recovery from the operation and four died, a mortality of sixteen per cent.

CASE I.—*Resection of four inches of the rectum from a point two inches above the anus, by Kraske's method; recovery; gain in weight, about fifty pounds in nine months. Second operation thirteen months later to re-establish the continuity of the rectum; death from infective peritonitis.*

Rev. W. W. F., of Pottsville, Pa., aged sixty-one, five feet five inches, weight 168 pounds, first consulted me November 16, 1891. He had lost fifteen pounds in the last eighteen months. For two years and a half he had had trouble in his rectum, with frequent bloody stools; sometimes his stools were watery without blood. Of late there had been an almost constant desire to evacuate the bowels; occasionally the call was so urgent that he had been unable to reach a convenient place before having the evacuation. His sleep also was disturbed by it. He had moderate pain and a great sense of rectal fulness all the time. His rectum had never been examined by his physician. Rectal touch revealed a large tumor, especially marked on the anterior wall of the rectum, beginning three inches above the anus. For a week before the operation the bowels were persistently evacuated, partly by enemata, partly by laxatives, both of which were administered daily, and it seemed as though the bowel had been completely emptied.

Operation December 2, 1891. By a curved incision from the posterior inferior spine of the ilium to just posterior to the anus the bones were exposed, the rectum separated, and the coccyx and the sacrum removed at the level of the third sacral foramina. Sep-

aration from the prostate and the bladder was very easy, excepting at the level of the diseased mass, where the adhesions were quite intimate, and in loosening them the peritoneum was opened purposely and quite widely; the bowel was brought down with difficulty owing apparently to the two inferior mesenteric arteries, which acted like guy-ropes. One enlarged gland was found in the meso-rectum. During the dissection the weakened bowel gave way at several points and allowed the contents of the rectum to escape. Sponges, however, were placed in the peritoneal opening and prevented contamination. The opening in the peritoneum was not closed by suture. The diseased portion of the bowel, beginning at a point six inches above the anus and terminating at a point two inches above the anus, was resected, and the cut upper end fastened to the soft parts at the end of the resected sacrum. A long rectal tube was carried up into the colon, and the bowel was then washed out continuously for at least ten or fifteen minutes. In spite of the preliminary cleansing, the amount of material seemed to be endless. I feared to prolong the operation, which had already lasted about two hours, and so desisted from washing out the bowel before it was entirely clean. The long time consumed was probably on account of its being my first resection of the rectum by Kraske's method, and I was therefore unfamiliar with its technique. The patient stood the operation very well. The amount of blood lost was only moderate. Three drainage tubes, one on each side and one posteriorly, were used. He

made a slow but satisfactory recovery, the wound filling up by granulation and closing in a month. When he got out of bed his weight was 147 pounds; three months later it had risen to 185 pounds, the heaviest weight he had ever attained, and he felt as well as he ever did in his life. By September, 1892, nine months after the operation, his weight had reached 192 pounds. No incontinence of feces existed during the night, but in the daytime he had no satisfactory control. In addition to this there was such prolapse of the bowel, often amounting to six or seven inches, that he desired if possible to have the continuity of the bowel restored.

Second operation January 19, 1893. On inserting a finger of one hand into the natural anus and a finger of the other into the artificial anus, I found that there was less than a quarter of an inch, apparently, between the two fingers. I therefore attempted to use Murphy's anastomosis button at this point by cutting a small opening with scissors, but the shank of the button was too short to allow of the penetration of the shank sufficiently to attach the two halves. Accordingly, after a somewhat persistent trial, I was obliged to abandon this method of anastomosis. I had carefully examined, as had also my colleagues, Professors Montgomery and Hearn, to see whether the peritoneal cavity was invaded by the opening just made. There being no evidence of its involvement, I drew a rope of iodoform gauze through the opening so as to keep it patent, with the intention of closing the artificial anus when the anastomosis was perfect. For two days everything went well,

but on the third day his temperature rose to 101.2°, the following day to 103.2°. On the second day the iodoform gauze packing was removed and the bowel thoroughly douched with warm boiled water. There was no tenderness over the abdomen and no other symptom to indicate peritonitis until the third day, when there was very slight abdominal tenderness. His strength, however, failed rapidly and he passed into unconsciousness, dying on the fifth day. No discharge of pus had occurred from either the anal or the upper portion of the bowel.

The post-mortem showed adhesions of the coils of intestine and of the pelvic organs throughout the pelvis, and considerable pus from the site of operation upward into the sac of an old indirect inguinal hernia.

Case II.—*Resection of six inches of the rectum by Kraske's method to a point eight inches above the anus, preceded by an inguinal colostomy (Maydl's method). Eight days required to cleanse the bowel after the colostomy. Recovery. No recurrence for four years and two months. Social and business life unhampered; good control of feces. Rides a bicycle.*

Mr. B., Philadelphia, aged thirty two, was first seen on June 10, 1892, in consultation with Dr. Wharton Sinkler and Dr. James C. Wilson. Weight in April, 1892, 175 pounds; best weight, 185 pounds. In 1876, when out camping, he lifted a heavy log, following which he had a hemorrhage from the bowels amounting to several ounces, but has had none since. No other ill effects followed, nor was he aware of anything having given way. His appetite had always been abnor-

mally great and he indulged it without wise restraint, both as to the amount and character of his food. He had also been remarkably constipated. In the autumn of 1891 he noticed that there was considerable mucus in his stools. In December, 1891, he had an attack of grippe, for which, in January, 1892, he went to Asheville, N. C. While there he had a severe attack of pain in the hypogastrium with diarrhea, and from that time on not only was there mucus but blood was observed almost daily, never however amounting to a hemorrhage. On May 30, 1892, he had such a violent attack of obstruction that his life was endangered, but it finally yielded to treatment. Another slight attack followed soon after. Hemorrhoids were also present and were very painful and tender, so that when I saw him it was not possible to introduce the finger to any considerable extent into the bowel, and I was unable to examine the rectum thoroughly. On July 16 he was etherized and three hemorrhoids were removed by the Paquelin cautery. I took advantage during this etherization to examine the rectum higher up. The moment that the sphincter was dilated a ring of teat-like processes appeared scattered over the rectum and merged at a higher level into a mass which there was no doubt was a carcinoma. Two of these processes were twisted off and were examined by Prof. W. M. L. Coplin. He reported that while the general structure of the specimen was that of an adenoma of the rectum, yet it pointed to a rapid degenerative process and for all practical purposes, therefore, was to be considered

a tubular epithelioma. As the weather was very hot and he had lost much strength in consequence of it, we did not deem it wise to make a radical operation at this time. He was therefore given a bland, liquid, nutritious diet, and later a solid diet as his stomach would assimilate it, the bowels kept loose with laxatives, and as soon as he was able he was encouraged to get up and walk out of doors.

Early in August he went to the seashore, and returned early in October weighing 168 pounds, a gain of 23 pounds in ten weeks. On October 22 he was etherized for the purpose of a thorough examination, which was participated in by Drs. Sinkler, Wilson, Robert F. Weir of New York, and Robert W. Johnson of Baltimore, as well as myself. It was found that the tumor had grown considerably in size, but was still movable and not attached to the bladder anteriorly. It was situated about four inches above the anus. The finger was passed through the lumen of the growth with difficulty, therefore it was not certain that we could reach the upper border of it.

Operation November 5, 1892. A Maydl operation was done in the left inguinal region on this date. The sigmoid flexure had a very short mesentery. Five hours after the operation he complained of pain due to the retention of flatus from a too acute kink over the glass bar. On attempting to pull down the upper part of the colon I found that it was very adherent, so that it required considerable force to loosen it. Three days afterward the sigmoid was opened by scis-

sors, the bar being left in place till the end of a week. For eight days after this the lower bowel was washed out every day, both from the artificial anus and the natural anus. After the first two days the return liquid was entirely clear, yet on the fifth day a large movement occurred from the natural anus, showing that considerable fecal matter still blocked up the rectum below the artificial anus. Fifteen grains of ox gall were then thrown into the lower rectum from above, which broke up and dislodged considerable fecal matter.

Operation November 16, 1892. Ether; duration of operation, two hours. Four and a half inches of the coccyx and sacrum were removed, going up to the third sacral foramen. The lower end of the spinal canal was opened and a small amount of cerebro-spinal fluid escaped. A catheter was held in the bladder to define the limits both of the bladder and of the urethra. The peritoneum was opened, as it was impossible to draw down the bowel without doing so, but was immediately fastened to the wall of the rectum by a continuous silk suture. The rectum was divided two inches above the anus and again at a point eight inches above the anus. The stump of the rectum was then attached to the end of the sacrum, two large drainage tubes were inserted, one on each side, and the anterior wound was packed with iodoform gauze. I did not suture the two ends of the bowel together—though mechanically this would have been possible—because the operation had already lasted two hours, his condition was not very good, and independent of this I was not much in favor of such anastomosis.

He made a slow but sure recovery, the wound closing entirely at the end of about six weeks. The tumor was examined again by Professor Coplin and pronounced to be a tubular epithelioma.

Four years and two months have elapsed since the date of the operation. The patient has been in such good health that his weight has exceeded 200 pounds. He was abroad for over two years, traveling in various parts of Europe along the Mediterranean, in Egypt, etc., and entering freely into all his ordinary social relations. His latest achievement has been to ride a bicycle (with a Christy and not a perineal leather saddle), which he has done without any trouble. The inguinal anus has been so comfortable that he has not cared to have any attempt made to re-establish the continuity of the bowel and close the inguinal anus.

His mode of dressing the openings is as follows: First, the sacral anus: as some mucus escapes from this he applies two squares of absorbent cotton and over that a sheet of wood-wool, retaining them in place by a T-bandage. Secondly, the inguinal anus: three pads of absorbent cotton to the right, left, and below the opening, then another pad over the whole, then rubber dam, another layer of cotton, and a binder.

At times the bowel protrudes from the sacral anus from two to six inches, but he has no difficulty in replacing it. His control over his movements is good. What is curious, in view of the absolute severance of the bowel at the inguinal anus into an upper and lower part, is that about every two weeks a

very small but positive fecal movement occurs from the sacral anus; evidently a small amount of the feces, which escapes from the upper colon at the inguinal anus, is forced back by the pads into the lower opening of the colon and finally escapes, as stated, through the sacral anus.

CASE III.—*Amputation of nine and a half inches of the rectum by Kraske's method, preceded by an inguinal colostomy (Maydl's method). Recovery. No recurrence after four years. Excellent control over evacuations. Social and business life unhindered. Can ride a bicycle.*

Mr. F. was kindly brought to me by Dr. H. W. Elmer, of Bridgeton, N. J., on December 14, 1892. Aged forty-six; best weight 185 pounds, present weight 152 pounds Two years before he noticed a fissure of the anus, which was followed by hemorrhage and constant discharge. On examination I found a distinct ulcer on the left side of the anus about one inch in diameter and extending upward. From that a very widely spread carcinomatous growth extended at least three to four inches up the bowel. He also had a left oblique inguinal hernia.

Operation January 6, 1893. I did a Maydl operation in the left inguinal region, and two days later opened the bowel with the Paquelin cautery, dividing it completely in two down to the bar. I then systematically washed out the rectum and colon both from the artificial and the natural anus.

Operation January 18, 1893. Kraske's operation was done, the incision passing from the left antero-posterior spine to a point an inch in front of the anus and encircling that

opening. A bougie was inserted into the bladder, and when I separated the rectum in front I found I had laid bare and recognized in the various steps of the operation the bulbous portion of the corpus spongiosum, the membranous urethra, the prostate gland, and a considerable portion of the wall of the bladder. The peritoneum was opened, but sutured soon afterwards to the anterior and lateral walls of the rectum. No enlarged glands were found. Nine and a half inches of the bowel were removed and the stump of the rectum attached to the end of the sacrum. A drainage tube posteriorly and iodoform gauze anteriorly were placed. No rise of temperature followed the first operation. After the second operation the temperature rose from the second to the fifth day to as high as 102.4°, but reached the normal on the ninth day. The stitches were all removed at the end of eight days. On the fifteenth day he sat up, and at the end of the fifth week went home. No irritation of the bladder followed.

Dr. D. Braden Kyle examined the specimen and reported that it was an epithelioma.

Present condition, December, 1896, after four years: A very moderate prolapse of the bowel takes place, especially in the summer-time. When that occurs he is obliged to stop and rest. I saw him December 21, 1896, within a month of four years after the operation. His weight is 185 pounds. He is in vigorous, robust health, and has been ever since the operation. He is one of the most active business men that I know. He comes frequently to the city in the morning in order

to make purchases for his several stores, and returns in the evening after a hard day's work. Ordinarily he has two voluntary movements, one at night and one in the morning. If his bowels are loose he is obliged to give very careful attention to himself, and sometimes is unable to attend to business satisfactorily. This is rarely the case, and commonly one would never know that there was anything abnormal in his person or his history. He usually defecates standing. His observations in regard to the flow of mucus from the sacral anus and his method of dressing the wound, with which he has had a good deal of experience and in which he has shown a good deal of ingenuity, are as follows:

"The amount of mucus depends altogether upon the amount of irritation, and that generally upon overexertion or temporary ill health. It is a wonderfully sympathetic part of my anatomy and is always affected by a bad cold with any accompanying coughing and sneezing, even the dynamic of nose-blowing finding a resultant there. Riding in a wagon on a rough road hurts it very much. I have tried the bicycle, but have not yet learned to ride it. I have succeeded in so arranging the pad of my bandage that all flow of mucus is absorbed, one pad lasting if necessary for twenty-four hours. The inguinal anus gives me no trouble beyond the necessary inconvenience attending the discharge of fecal matter, and that has been reduced to a minimum. Occasions of being caught so that I am obliged to run to cover are very few and far between, and it is getting to be the rule that I require no attention between rising and retiring.

"I dress the anus as follows: a thin layer of antiseptic wool, another of absorbent cotton about the size of a sheet of paper (six by ten inches), a piece of muslin of the same size, then another layer of cotton still larger, another of muslin, then a sheet of rubber dam and a bandage of heavy unbleached muslin is an absolute defense against any happening excepting genuine diarrhea, and that has to be very bad to get away with me. If a movement occurs that is formed and I can attend to it soon, frequently only the first or second layer needs to be discarded. At night there is frequently very little mucus. My truss is a powerful safety guard, holding the lower edge of the bandage tightly to my body, preventing the escape even of very thin fecal matter, and I do not see how I could get along without it even if there were no hernia. My eating habits are methodical. I make it a rule to eat stewed or raw fruit for supper and drink somewhat freely. A cup of strong coffee on getting out of bed in the morning or before brings everything down and out in good shape within an hour, and then I dress and go about my business with serene confidence."

(This observation as to the truss would suggest that in such cases a dummy truss might be used to advantage.)

His method of dressing the sacral anus is ingenious and might prove useful to others. With a view both to absorbing the mucus and preventing the prolapse of the bowel he uses an ordinary metal shoe-horn, the convex surface turned next to the skin and narrow end forward, and covered as follows: a piece of

canton flannel four by six is folded lengthwise, the corners turned, and the shoe-horn slipped in between the two folds and fastened by safety-pins; a second layer of canton flannel, then a double layer of absorbent cotton slightly wider than the flannel, and a layer of globe antiseptic wool about an inch wider than the absorbent cotton. To prevent chafing, some aristol is spread on the surface of the sterilized wool. All of these layers of cotton, wool and flannel go between the shoe-horn and the skin; the whole is then kept in place by the T-bandage already mentioned.

CASE IV.—*Five inches of rectum amputated by Kraske's method, preceded by an inguinal colostomy (Maydl's method). No return after four years. General condition satisfactory.*

Geo. M. R., aged fifty, was admitted to St. Agnes' Hospital November 15, 1892, at the instance of Dr. John J. Black of New Castle, Del. I publish the case by the kind permission of Dr. A. W. Ransley, with whom I was associated in its management. He had had dysenteric symptoms for four months. An extensive, very soft, bleeding carcinoma of the rectum was found by touch. Operation December 3, 1892. An inguinal colostomy was done by Maydl's method. The bowel was opened on the second day. Second operation December 15, 1892. Amputation of the rectum was done, the sacrum being divided transversely between the second and third sacral foramina. About five inches of the bowel were amputated, and the upper end sutured to the end of the resected spine.

Present condition: There is no indication of a return of the disease after four years. The inguinal anus does not annoy him seriously, but he is somewhat reluctant to go into society. He has on an average two movements a day, morning and evening; has no control over them, but is aware of them before they pass. There is a moderate protrusion of the bowel at the inguinal anus, two and half inches, and about three inches from the sacral anus. He is not annoyed by the amount of mucus discharged from the bowel. His general health is first-rate.

Dr. John J. Black, who kindly sent him to me at the hospital, says that "to-day he would pass for a man hale and hearty, forty years of age; eats everything and plenty of it. No irritation from abrasions of the skin."

CASE V. — *Amputation of six and a half inches of the rectum by Kraske's method, preceded by inguinal colostomy (Maydl's method); bowel not fully cleansed after seventeen days' constant washing; spinal canal opened. Recovery.*

Joseph A., aged forty-six, Altoona, Pa., entered the Jefferson Hospital October 13, 1893. His family history is good. Up to January, 1893, he had always been well, but at that time he noticed a slight amount of blood in the stools. This continued almost all the time up to his admission to the hospital. Constipation of late had been very marked; the fecal masses were diminished in diameter until they had become ribbon-like. He had very little pain, but great discomfort in the rectum; no vomiting; loss in weight fifteen pounds. On examination I found a rather slender man with a moderately cachectic look.

Specific gravity of urine 1.023, no albumen, a slight trace of sugar. By rectal touch, an inch above the anus, a hard irregular mass was immediately encountered; the fingers could not be passed through it. I found also some hemorrhoids. By abdominal examination the descending colon and sigmoid flexure showed a row of irregular lumps, whether hardened feces or extension upwards of the disease I was uncertain. I advised an exploratory operation in the left iliac region to determine, first, the nature of these masses, as a differentiation between scybala and cancer could not be made by means of high injections on account of the obstruction by the disease; secondly, if they were found to be scybala, that a Maydl operation should be done immediately and the extent and character of the rectal growth be determined; thirdly, if they were found to be nodules of disease, that a right colostomy be done. Left inguinal colostomy by Madyl's method was done October 15, 1893. The hardened masses were found to be scybala. The bowel was opened twenty-four hours after the operation by a longitudinal incision by the Paquelin cautery. The bar was removed at the end of a week. From October 16, when the bowel was opened, to November 2, a period of seventeen days, the bowel was washed out both upwards and downwards toward the stomach and toward the rectum by copious enemata, sometimes of warm water and sometimes of ox gall, with the intention of absolutely cleaning out the bowel. Injections were also made from the anus, but very small amounts of fluid could be passed in in this way.

I appointed the Kraske operation for the 28th of October, twelve days after the opening of the artificial anus, but on that morning, in spite of all the washing out already done, he was taken with diarrhea, during which an immense quantity of feces poured out of the artficial anus, the oozing being almost continuous for about sixteen hours. The fecal torrent having then been arrested and the bowel apparently clean, I did the Kraske operation on November 2, 1893. The coccyx and two and a quarter inches of the sacrum were removed; the prostate and part of the bladder were uncovered in the dissection. I attempted to remove the diseased portion without opening the peritoneum, but found it impossible to get above the upper edge of the disease. Accordingly the peritoneum was opened, the rectum drawn down, and the peritoneum immediately sutured to the anterior wall of the rectum, thus closing the cavity. In order to obtain access to the rectum I found it necessary to remove three-quarters of an inch more of the sacrum, making three inches in all of the sacrum and coccyx. The spinal canal was opened by the removal of this portion of bone. When doing this, at the left edge of the coccyx I discovered a considerable area of the bone so softened that the finger-nail could easily break it down. All of this left side up to the border of the great sacro-sciatic foramen was then removed by forceps and gouge. No enlarged glands were found in the meso-rectum. The anal portion of the bowel which was normal was so small that I removed this as well as the diseased part. The portion removed measured six

and a half inches. The stump of the rectum was attached at the end of the resected spine.

The hemorrhage was only moderate. Iodoform gauze was packed posteriorly and anteriorly to the rectum. The operation lasted an hour and three-quarters and the patient showed marked shock, but reacted very well. To my surprise, on the second day after the operation, in spite of all the washing out begun nineteen days before, a very large amount of fecal matter was discovered impacted in the rectum and had to be removed mechanically, after which a considerable amount was spontaneously evacuated during this and the next day. On the sixteenth day the patient sat up, and on the twenty-fifth day left for his home. His highest temperature was 102°, and the normal was reached at the end of a week. Except where the gauze drains were placed, absolute union by first intention took place. No later history has been obtainable.

CASE VI.—*Cancer of the rectum, anus, and vagina. Amputation of six inches of the rectum by Kraske's method with a V-shaped piece of the recto-vaginal septum, preceded by an inguinal colostomy by Maydl's method. Death in thirteen hours from shock.*

Mrs. P. M. was first seen June 10, 1893. Aged thirty; married five years, three children. Before her marriage she suffered from prolapse and retroversion of the uterus and moderate prolapse of the bowel. Two years and a half previous to my seeing her she noticed a very slight pinkish discharge from the rectum, but had no pain in defecation until sixteen months subsequently. Since that time

the pain had gradually increased until it became excessively severe, keeping her in misery for a number of hours after each movement. During this same time the fecal masses had diminished in diameter until they became the size of the little finger. In December, 1892, a small portion of the growth was removed by another surgeon. The growth was at that time thought to be benign, but the microscopical examination showed it to be malignant. I etherized her in order to make a careful examination. Nothing abnormal was found in the abdomen. At the anus there was an ulcerated mass entirely surrounding the orifice, with outgrowths of an inch or more in length. The introduction of the finger showed a hard nodular growth surrounding the rectum. By some pressure the finger could be forced through the growth and detect its upper limit. The recto-vaginal wall was partly involved on its rectal aspect up to the junction of the vagina and uterus, but the mucous membrane was not involved, excepting just at and above the anus.

June 17, 1893, Maydl's operation was done. There was some difficulty in finding the colon, which was displaced far to the right. The colon was stitched at each end of the incision. The bowel was opened three days later by the Paquelin cautery, dividing it completely to the bar.

June 28. After having daily washed out the lower bowel through the artificial anus with ox gall, boiled water, boric acid, etc., a Kraske amputation of the bowel was done. In separating the soft parts from the sacrum and coccyx posteriorly I was struck with the

advisability of not going too close to the bone, so that the vessels which bled freely could be caught much more easily than when they were severed very close to the sacrum.

The sacrum was resected at the level of the third sacral foramen. No enlarged glands were felt in the meso-rectum. The rectum was dissected loose chiefly by the finger, the levator ani being divided by knife and scissors. The incision was then carried around the anus and sufficiently far into the vagina to include a generous healthy portion, as well as the diseased portion of the septum. With one finger in the vagina it was easy to ascertain the limits and relations of the diseased portion to the rectum, and a V-shaped piece was removed, its apex reaching nearly up to the uterus. The peritoneal cavity was opened, the rectum drawn down, and the peritoneum then stitched to the anterior and lateral borders of the rectum. Six inches of the rectum were amputated. The posterior wall of the vagina was now united by a continuous Lembert suture, approximating the raw outer surfaces of the vaginal wall on each side. Drainage tubes were placed at the anterior and posterior extremities of the wound, which otherwise was closed. The operation lasted nearly an hour and three-quarters. The patient was in marked shock. Before the operation she had had $\frac{1}{4}$ grain of morphine and $\frac{1}{25}$ grain of strychnine, and $\frac{2}{25}$ were administered during the operation. During the night the same medication was continued as needed, together with stimulants and external heat. Her temperature barely rose to 100°, but her pulse never became perceptible, and she died sud-

denly at 3 A.M. apparently from heart clot, thirteen hours after completion of operation.

CASE VII.—*Cancer of rectum. Five inches of the rectum removed from four to nine inches above the anus by Kraske's operation without prior colostomy. Death after fifty-six hours from uremia.*

Samuel S., aged forty-one, was sent to the Jefferson Hospital by Dr. Stahren March 12, 1896. Family history excellent. He was a moderate drinker; denied syphilis. A year previous he observed a burning sensation in the rectum during defecation. This increased in severity till it became quite painful. After a considerable time he began to pass bloody stools, lost his appetite, and not infrequently had nausea and vomiting. The bowels alternated between constipation and diarrhea. He had lost about ten pounds in weight. On admission his temperature was 97.6°; pulse 98, full and of high tension. The arterial coats were markedly thickened; aortic sounds slightly accentuated. Urine 1.022, no albumen or sugar; urea 2.2 per cent. About three inches above the anus an indurated ulcerated tumor was felt involving the entire circumference of the rectum and constricting it.

Operation March 18, 1896. Owing to his diseased arteries I hastened the operation as much as was possible, and finished it in an hour and a quarter. Four and a half inches of the coccyx and sacrum were resected to the level of the third sacral foramen. The rectum was separated from the adjacent parts without difficulty. The disease began about four inches above the anus, and the part resected was five inches long. No glands were

felt in the meso-rectum. The peritoneum was opened and immediately fastened to the peritoneal surface of the rectum. The stump of the rectum was then fastened at the end of the resected sacrum. The wound became smeared from the fecal matter which was discharged from above the disease, but great care was taken to prevent infection by packing one part of the wound with iodoform gauze while working at another part, and by careful washing with bichloride of mercury afterward. Only about a dozen ligatures were needed. An iodoform gauze drain was passed through the anal segment and the anus, another behind the normal anus, and a third was pushed up into the bowel so as to prevent any fecal infection. It was not possible to approximate the two ends so as to restore the continuity of the bowel. During the night after the operation the temperature rose to 100° and he became delirious, with also a very marked diminution in the amount of urine. In the first twenty-four hours after the operation he only secreted 13½ ounces of urine; in the second twenty-four hours only 3½ ounces; and in the next eight hours, at the end of which time he died, no urine whatever was secreted. By an unfortunate misunderstanding the urine was not examined. Every means were taken to increase the action of the kidneys, but he died from uremia in spite of them. Dr. Kyle reported that the specimen showed the growth to be a tubular epithelioma.

Case VIII.—*Amputation of two and a half inches of the rectum by the perineal route, with removal of the coccyx* (*Kocher's method*), *but*

no prior colostomy. Artificial sphincter attempted by Gersuny's method followed by infection. Recovery.

Mrs. B., Vinemont, Pa., aged forty, was admitted to the Jefferson Hospital February 13, 1894. Her mother died of tubercular laryngitis. There is no family history of cancer. For two years she had a sense of rectal bearing down and tension, and occasionally passed blood by the bowel. The pain in the rectum was more severe after exercise. The bowel movements were obstructed. She had no nausea or vomiting, but had lost weight till she now weighed only 103 pounds. Urine normal.

On examining the rectum I found a very distinct nodular growth which began at the anus, but extended only an inch above it. I therefore did no preliminary colostomy, but on February 16, 1894, proceeded to the amputation of two and a half inches of the bowel. The coccyx was removed and the rectum rapidly detached both from the bones behind and the vagina in front. One enlarged gland was found in the post-rectal space. The peritoneum was exposed, but not opened. In this case, in order to obtain an artificial sphincter, I adopted the method of Gersuny, twisting the bowel 270 degrees until there was considerable resistance to the introduction of my finger. It was then sutured to the surrounding skin. Two days after the operation her temperature rose to 102°; the packing which had been put at the anterior extremity of the wound was removed, and I found that feces had escaped in the intervals between the stitches and infected the wound. One

stitch was cut to allow of more efficient drainage and the parts then washed out carefully. After this she made a very good recovery and went home March 8, 1894. Dr. D. Braden Kyle reported that it was an epithelioma. I have written to her since then, but have received no reply.

CASE IX.—*Amputation of three inches of the rectum by Kocher's method. Recovery.*

M. D. K. entered the Jefferson Hospital February 14, 1893. Up to 1878 he had been in good health. He was an enlisted soldier at that time and much exposed to the weather, and suffered much from diarrhea and hemorrhoids. The latter were operated on in the post hospital October, 1878, and several times since then. He, however, was never free from the hemorrhoidal trouble, and finally was discharged from the service in 1891. In March, 1892, the hemorrhoids were again operated on, but he has never been well since. He suffered from a constant burning pain in the rectum, and passed at times small amounts of clotted blood. Defecation was very painful; there was no trouble with the urinary organs. On examination a considerable ulcerated surface was seen and felt surrounding the anus, with a mass of infiltrated and hard nodular tissue extending two inches up the rectum. The slightest manipulation caused bleeding.

Operation March 1, 1893. Three inches of the rectum were amputated and the stump attached to the skin of the perineum. The coccyx was removed to give access to the mass, but none of the sacrum. The peritoneal cavity was not opened. The wound

healed by first intention, the stitches being removed in a week. The highest temperature was 102°. Three weeks after the operation he went home entirely well. No later history has been obtainable.

CASE X.—*Amputation of four inches of the rectum by the perineal route without prior colostomy. Recovery.*

Mrs. X. The notes of this case are unfortunately lost, and I can only give a meagre outline. The case was one of carcinoma of the rectum involving the anus, which I operated on in the Jefferson Hospital in 1890. About four inches of the rectum were resected without removing the coccyx or opening the peritoneum. The patient made a prompt recovery. Of her condition since then I have been unable to learn anything.

CASE XI.—*Amputation of three inches of the rectum by the perineal route; recovery. General health and business activity entirely restored. No return in four years, when he died from an acute diarrhea.*

Mr. McK., aged fifty-four, was seen in consultation with Dr. H. G. Hill February 1, 1891. Prior to seeing Dr. Hill he had thought he had hemorrhoids for some years. On examination Dr. Hill immediately detected the growth—epithelioma of the anus and rectum for two and a half inches.

Operation February 6, 1891. Three inches of the lower end of the bowel were amputated, the peritoneum not being opened. No bone was removed. A sound in the bladder was useful as a guide. The end of the bowel was sutured to the skin, a drainage tube being introduced on each side of the ischio-

rectal fossa and retained for three days; highest temperature 101°, which was not as high as it sometimes had been before the operation; primary union, except at a very small point at the anterior portion of the wound.

Final result: He had very good control over the contents of the rectum except when the bowels were loose, which did not occur often. He gained in weight and his general health was excellent, so that he attended to an active business, but suffered from repeated attacks of tic douloureux. I saw him occasionally for two or three years.

January 25, 1895. I have just learned that he died a few days ago of acute diarrhea under the care of a homeopathic physician. There was no return of the disease so far as I could learn, although there was only lacking a month of four years since the operation.

CASE XII.—*Amputation of two and a half inches of the rectum and anus by the perineal route. Recovery.*

B. R, aged forty-three, entered the Jefferson Hospital March 2, 1891. Family history good. For fourteen months he had had severe pain in defecation. Operation March 5, 1891, two and a half inches of the rectum were amputated, including the anus. The peritoneum was not opened. The end of the bowel was sutured to the perineum. Healing by first intention. A recent letter has been returned with information that he is probably dead.

CASE XIII.—*Amputation of five inches of the rectum by the perineal route without prior colostomy. Peritoneal cavity not opened. Arti-*

ficial sphincter by Gersuny's method followed by infection. Recovery.

Mr. R., aged thirty-three, Philadelphia, Pa., was admitted to the Jefferson Hospital May 22, 1894. Family history good. Ten years previously he had malaria and dysentery, and three years later gonorrhea. Four years previous to admission he received a bad bruise in the region of the anus by sitting down upon the knob of a faucet. A year prior to this accident he noticed that his stools were gradually becoming smaller in diameter, and once in a while he noticed clots of dark blood and mucus, all of which were attributed to hemorrhoids. The pain in defecation gradually increased. Within the last year the fecal masses had been reduced to the size of a lead pencil, and he had had alternate constipation and diarrhea. On examination I found a well nourished and apparently healthy man, with a fair appetite, suffering no pain excepting on defecation. By rectal touch an evidently malignant growth was felt, beginning just within the anus and at a point two and a half inches above the anus; the stricture was so tight as not to be permeable by the finger. Urine negative. For a week he was in bed, during which time the bowels were carefully evacuated and his diet regulated.

Operation May 24, 1894. An elliptical incision was made around the anus, extending posteriorly to the tip of the coccyx. The rectum was then separated partly by scissors and partly by blunt dissection until healthy tissue was reached. The dissection was very difficult on account of the adhesions, but was

facilitated by splitting the rectum and carrying the left forefinger up into the gut. It was not necessary to remove the coccyx. In the anterior part of the wound were disclosed the bulb of the corpus spongiosum, all of the prostate gland, and a considerable portion of the bladder. Although five inches of the rectum were resected the peritoneal cavity was not opened. The stump was twisted 180 degrees and fastened to the skin by very close stitches. In front of the rectum and behind it gauze packing was inserted. The calibre of the rectum itself was also packed with a considerable pledget of iodoform gauze to prevent the escape of fecal matter and infection. The stitches gave way and infection of the wound took place. The temperature, which up to that time had been about 100°, on the twelfth day rose to 102.4°, but fell to the normal in two days. He was discharged from the hospital on July 3, the entire wound being healed excepting a small sinus in front of the anus.

March 1, 1897. Two years and ten months have now elapsed since the operation, and he writes me that there is no evidence of any recurrence, that he has "fair control over his movements and always has warning at time of stool, of which he has about two or three a day." There is no protrusion of the bowel and only a trifling mucous discharge. His general health is excellent.

Case XIV.—*Cancer of anus and rectum. Removal of* V*-shaped portion of bowel, including the sphincter, by the perineal route. Recovery.*

Joseph N., aged twenty-nine, was admitted

to the Jefferson Hospital March 10, 1896. His family history is good. Two years prior to admission he had a fistula *in ano*, which was operated on, but left an ulcer which never healed. On examination I found a very marked indurated chronic ulcer of the rectum just within and partly involving the sphincter in the median line posteriorly.

Operation March 11, 1896. I removed a V-shaped portion of the anus and rectum, the apex of the V being an inch and three-quarters from the anal margin. The portion of the sphincter excised was nearly an inch. The mucous membrane was stitched together, special care being taken to see that the ends of the sphincter muscle also were well approximated. Before the operation a tampon of iodoform gauze was pushed up into the rectum to keep the wound clean, and was left there for three days after the operation. A small amount of opium was given daily to constipate. March 30, 1896, he was discharged almost well. The sutures had cut out to a small extent and produced a little local raw surface. He is still living.

Dr. D. Braden Kyle examined the specimen and pronounced it a squamous-celled epithelioma.

Case XV. — *Resection of four inches of the rectum and sigmoid flexure by abdominal section. Approximation by Murphy's button only partially practicable by reason of the silk thread catching in the thread of the screw. Appendix also removed. Sloughing of the bowel. Death on the third day.*

Mrs. W., aged thirty-three, was kindly sent to the Jefferson Hospital by Dr. Vaughan, of

Middletown, Del., November 19, 1894. Her maternal grandfather died of cancer of the stomach; otherwise her family history was good. She had not lost weight. She always enjoyed good health till September 1, 1894, when she had an attack of cholera morbus. This was followed by what was thought to be an appendical abscess, as she passed considerable pus by the rectum. She had been very much constipated ever since, and for two weeks had no movement of the bowels. There had been considerable nausea and vomiting, not fecal in character. She suffered from much flatulence and tenderness, especially in the right iliac fossa. Her temperature had been normal or even subnormal constantly, excepting for two days, when it rose to 100.6°.

A careful examination of the rectum gave no information. The abdominal wall was so thin that the coils of intestine and their active peristalsis were easily seen. No tumor could be discovered anywhere. Various purgatives and enemata were tried for ten days in order to unload the bowels; high enemata were then used by Hegar's method. The largest amount which could be injected was a quart; more than this caused considerable pain. This however at last enabled me to discover the source of the trouble. The enema by this method with the pelvis raised forced from the pelvis into the abdomen a lump about two inches in diameter. The tumor was movable; it was just above and to the left of the pubes. By various means the bowels were gradually unloaded, but the tumor still remained.

Operation December 7, 1894. In view of my ability to displace the tumor from the pelvis into the abdomen, I determined to operate by way of the abdomen. This was opened in the middle line and the appendix first explored. This was found to be nearly five inches long, very much twisted, and completely filled from one end to the other with a row of oval fecal concretions. Deeming this a very probable future danger the appendix was removed. The sigmoid flexure was very long, the loop reaching over to the right iliac fossa; its walls seemed to be markedly thickened. Passing the hand into the pelvic cavity I was able to draw out the tumor already alluded to. This was a puckered mass on the anterior side of the colon and was so low down that it was with great difficulty that it could be drawn out of the pelvis sufficiently for operation. Below the tumor, the sigmoid and rectum were narrowed, but from the tumor upward for about fifteen inches the whole of the descending colon and the sigmoid flexure were thickened, especially at the longitudinal bands. I was quite uncertain whether the whole mass was cancerous or whether the thickening might not result from the former inflammatory attack, but as I found the mesenteric glands enlarged I thought it wise to excise the tumor and the adjacent most markedly diseased colon. Four inches of the bowel therefore, including the nodular mass, were resected, a small V-shaped portion of the mesentery being taken out, the apex of which was only about an inch from the colon, and an end-to-end anastomosis was then effected by a

Murphy button. The lower half of this fitted into the calibre of the bowel rather snugly, but the upper end of the bowel was so dilated and thickened that there was great difficulty in inverting the end satisfactorily. Moreover, when I attempted to approximate the two halves of the button, after they had approached each other about half the proper distance, I found that I could not approximate them any further. Accordingly, I surrounded the button with two rows of Cushing's right-angled sutures. Dr. D. Braden Kyle, to whom the specimen was given for examination, reported that it was a tubular epithelioma.

Immediately after the operation fecal movements began. In the first twenty-four hours she had nine, not diarrheal, but of soft feces, and in the next twenty-four hours there were seven movements, and a few more afterwards. On the evening of the second day when I saw her she was bright and cheerful, her temperature was normal, her stomach had quieted entirely, and there was no pain. At 10 P.M. she was suddenly seized with violent abdominal pain, passed into collapse, and died at 10 A.M. on the third day.

The autopsy showed that the stitches had held, but that an inch and a half of the upper dilated end of the bowel had sloughed and caused perforation. On removing the button I found the obstacle to complete approximation of the two halves lay in the fact that one end of the silk ligature around the collar of the button had been caught between the two tubes as one was thrust into the other, and when it was drawn taut no further approximation of the halves could be made.

Abbe (*Annals of Surgery*, January, 1895, p. 71) has reported a similar case. The unexpected difficulty that I had points to the fact that we ought to see that the two ends of the silk are cut short enough not to catch in the thread of the screw.

CASE XVI.—*Inoperable carcinoma of rectum. Lumbar colostomy. Death in about two years.*

John W. F., of Washington, D. C., was first seen at the request of Dr. S. Weir Mitchell June 8, 1885. Six weeks before he thought he had piles, as a small amount of blood was seen in his movements. The fecal masses were of good size. He had bearing down pains, especially marked in the sacral region, with a sense of fulness in the rectum, though there was little or no pain. Four inches above the anus posteriorly a tumor was felt. It stretched two-thirds around the rectum and was firmly attached to the sacrum; was hard, irregular, and nodulated. I regarded the case then as inoperable. In about five months the cancerous circle was completed. A year later a lumbar colostomy was done by another surgeon. This relieved him greatly. He died about two years later.

CASE XVII.—*Inoperable cancer of the sigmoid and rectum. Right lumbar colostomy. Peritoneum opened; great difficulty in deciding upon which was the colon and which the small intestine. Operative recovery; death about a year later.*

Mrs. W., aged sixty, wife of a physician living in Minnesota, consulted me in the winter of 1887. She had suffered for nearly a year with constipation and diarrhea, with diminished fecal masses and a great deal of

pain in the left inguinal and sacral regions. She had lost considerably in weight. The instant that the fingers were placed upon the left lower abdomen, just at the upper border of the pelvis, a long sausage-shaped tumor was found, the lower end of which was lost in the pelvis, the upper end reaching a little above the anterior superior spine. By the rectum the finger could just touch the lower border of the growth. The diagnosis was evident and no radical operation possible. Accordingly, I did upon her a lumbar colostomy, in the right lumbar region. I was unable to find the colon without opening the peritoneum. When I opened it two coils of intestine presented themselves. I was utterly unable to distinguish at first which was the colon and which the small intestine. I was unable to recognize any longitudinal bands in the colon *in situ*, and the colon could not be drawn out sufficiently to enable me to see them. Finally, as the result proved, I decided on the right one, more I am bound to say by good luck than by good judgment. She died about a year later. The difficulty which I had in this case decided me positively, therefore, to abandon lumbar for inguinal colostomy. In addition to this the advantages of inguinal colostomy, which I think are very many, almost decided me independent of the difficulties experienced in this case.

Case XVIII.—*Inoperable cancer of the rectum. Lumbar colostomy. Recovery. Death twenty-four days after operation from acute entero-colitis.*

George C., aged forty, Beverly, N. J., was kindly referred to me at the Jefferson Hos-

pital by Dr. J. B. Walker, of Philadelphia, on May 11, 1891. Best weight 169 pounds, in August, 1890; present weight 137 pounds. His history showed chronic constipation. In August, 1890, he consulted a physician, who said that he had trouble in the sigmoid flexure. When Dr. Walker first saw him just prior to his admission to the hospital he discovered a lump at that point. The tumor was the seat of a dull ache, with shooting pains down the left leg.

On examination a tumor was felt in the left iliac fossa, and when the finger was passed into the rectum the tumor was felt about two and a half inches above the anus; reciprocal pressure could be felt both above and below. The disease being so very extensive I deemed it inoperable and advised a left lumbar colostomy. This was done on May 26. The bowel was not opened for three days, as there was nothing urgent about the case. He left the hospital June 5 entirely recovered. A very sudden change of the weather took place the day he left the hospital, and he apparently took cold, fell severely ill of an entero-colitis, and died two weeks later.

Case XIX.—*Inoperable cancer of the rectum. Inguinal colostomy by Maydl's method. Bowel opened in six hours; great relief. Death from exhaustion thirty-one days after the operation.*

Miss C. B. was seen in consultation with Dr. G. R. Morehouse February 17, 1893. There had been absolute obstruction for eleven days, excepting that the enemata used had brought away small masses of fecal matter. The abdomen was so much distended

as to interfere with respiration, and there was every evidence of impending speedy dissolution. A small bed-sore existed over the sacrum, and the patient was emaciated to the last degree. Rectal touch showed that the rectum was full of solid feces, and the tip of the finger discovered a cancerous mass. As she had no power to expel the contents of the rectum they were removed piecemeal by the finger and a spoon-handle. This being done, the hard mass was felt as a nodular growth, the mouth of which was so softened that the disease could be broken down by the finger-nail. Evidently radical treatment by excision could not be entertained for a moment; a palliative operation would be all that could be done. Accordingly, the same day a Maydl operation in the left iliac fossa was done in a very few minutes. Six hours after the operation the bowel was opened with the Paquelin cautery without hemorrhage. The adhesions were perfect. Small quantities of gas and feces were passed in the next twenty-four hours, with great relief. The subsequent comfort that she had entirely warranted the operation. Two weeks after the operation I removed the glass bar and tied the mesenteric portion of the bowel by a rubber band. Forty-eight hours later I completed the division by the scissors. The feces between the artificial anus and the rectal tumor were partly voided through the artificial anus, but most of them mechanically by the finger. Her strength failed gradually, and she died from exhaustion March 20, thirty-one days after the operation.

CASE XX.—*Extensive carcinoma of rectum*

and colon. Palliative right inguinal colostomy (Maydl's method). Recovery from operation. Death from exhaustion fifteen days later.

Mrs. D., aged forty-four, was sent to the Jefferson Hospital January 15, 1895, by Dr. R. Wallace of East Bray, Clarion Co., Pa. She ceased menstruating one year prior to this date; was always in good health until two years before, when she had what was thought to be a fissure of the anus. On dilating this, a stricture of the rectum was found. Her health had gradually failed, and in the last two months she lost eight to nine pounds; color sallow; appetite poor; pain on defecation intense and continuous. The pain extended over the entire sacral region. On examination I found that as far as the finger could reach there was an extensive carcinoma of the entire bowel, involving the whole of the recto-vaginal septum, but not the vagina itself. Abdominal palpation revealed no tumor. Her general health was so poor and the disease so extensive that I very quickly made up my mind that nothing could be done excepting in the way of palliation. Accordingly, on January 23, 1895, I opened the abdomen in the left region to determine whether the colon was healthy, and if so to make an artificial anus by Maydl's method. As soon as the cavity was opened I found that the descending colon was studded with growths of a size somewhat smaller and larger than a pea. The wound was immediately closed and the abdomen opened on the right side, where the Maydl operation was done. Three days later the bowel was opened transversely to one-third of its circumference by

scissors, and some vessels tied. A week later the glass bar was released by cutting through the remaining portion of the bowel. My object in waiting a week was to allow of such firm adhesions that there would be no danger of the bowel falling back into the abdomen. The operation gave her great relief, but her strength failed very rapidly, and she died on February 7, 1895, fifteen days after the operation. Before the operation her temperature had risen to 103.2°, but immediately afterward fell to 100° and below. I made some cultures from the abdominal cavity, and these Dr. Kyle reported showed both staphylococcus and the bacillus coli communis, though there was no suppuration either before or after the operation. The infection may have been an accidental one at the time of operation, but every possible means were taken to prevent it.

CASE XXI.—*Inoperable carcinoma involving the caput coli, ileum, sigmoid flexure, and rectum. Celiotomy. Artificial anus made in the ileum by Maydl's method gave relief and lowered the fever. Death on fifth day.*

Mrs. G. B. R. was first seen in consultation with Dr. Eleanor C. Jones March 20, 1896. Aged thirty-seven; present weight 95 pounds; best weight 110 pounds two years ago. Her family history was excellent. On September 1, 1895, she first observed distinct pain in the rectum. In the course of a couple of months she observed that the feces were streaked with blood. No diminution in the size of the fecal masses had been observed. On October 30, 1895, she was examined by Dr. Broomall and Dr. Jones together, and they observed nothing abnormal in the rectum.

On March 9, 1896, she had been etherized by Dr. Jones and a small tumor found on the anterior wall of the rectum just within reach of the finger. Scrapings from this were taken, and Dr. Robert Formad reported them to be carcinomatous, which report was confirmed by Dr. Kyle. Dr. Jones had examined her blood and found the hemoglobin to be sixty per cent., and that no plasmodium existed. The urine was negative, and both urine and stools were free from tubercle, as also were her lungs.

Examination March 20, 1896. I found a rather slender and feeble looking, though sprightly, woman. The rectal tumor alluded to was readily found on the anterior wall of the rectum just above the upper end of the vagina. It was quite tender to the touch, and no satisfactory examination could be made as to its size or its relation to the uterus or the ovaries. On examining the abdomen another small lump as large as a large cherry was felt just below the right border of the ribs in the nipple line. Pressure by the finger appeared to locate it in the abdominal wall, though it might have been more deeply situated. She was then etherized. The rectal tumor extended into the pelvis and was evidently a carcinoma; I could just reach it with my finger on deeply depressing the perineum. By bimanual examination it seemed to be continuous with the uterus, and I judged that the two were adherent. She absolutely demanded an operation, preferring to take the chances of dying to living the wretched life that she had before her. I decided therefore to operate after building her up as much as possible.

Operation April 10, 1896. The last mandate that she gave me as I left her room before the etherization was: "Mind that you take it all out." A celiotomy was done in the median line below the umbilicus. I found a mass two-thirds the size of a fist uniting the caput coli, the lower part of the ileum, a coil of the sigmoid flexure of the colon, and still lower down the rectum. On its surface ran the appendix four inches long, but about twice the normal diameter. The tumor did not encroach seriously on the calibre of the bowel. It lay immediately behind the uterus, but was not adherent to it. Both ovaries were markedly sclerotic and cystic. Removal of the mass was utterly out of the question. Accordingly I made an artificial anus in the lower ileum about twelve inches from the caput coli by Maydl's method. Before doing this, however, I examined the tumor felt at the border of the ribs and discovered that it was a distended gall-bladder, and that there was a stone as large as the last joint of the thumb in the cystic duct. As it gave her no trouble and her life would evidently be short I did nothing with it. A coil of the ileum was now drawn out and the skin stitched together through a hole in the mesentery after the recommendation of Bidwell (*Lancet*, 1895, ii, 753). On the third day after the operation the intestine was opened, and this gave her great relief. Her strength however failed, and she died five days after the operation. Prior to the operation her temperature had risen as high as 102.4°, but after it and until just before her death it never rose above 100°.

CASE XXII.—*Cancer of rectum. Palliative colostomy only, on account of cardiac and costal complications. Schleich's fluid used instead of ether. Recovery.*

Hiram F., aged sixty-five, was kindly referred to the Jefferson Hospital by Dr. C. H. Shivers, of Haddonfield, N. J., March 1, 1896. Family and personal history excellent, except that when in the army in 1861 he had some vague heart trouble and had never been able to do any heavy work since, nor for the last fifteen years had he done any work. A year before he noticed a burning sensation about the rectum, which gave him great pain after defecation. He had lost about twenty pounds in weight in two years. Two and a half inches above the sphincter an indurated cancerous mass was found entirely surrounding the rectum. The case was one eminently fitted for extirpation, probably without any resection of the bones except possibly of the coccyx; but I decided on a colostomy by Maydl's method, for the following reasons: first, his heart was almost certainly fatty, as was determined by Dr. J. C. Wilson, who kindly saw him with me; second, his pulse was very weak and intermittent; third, the cartilages of the ribs were entirely ossified and the lower ribs united to each other, so that the chest-wall moved very imperfectly, and only as a whole up and down and to a slight extent. This greatly interfered with his respiration.

Operation March 4, 1896. For the reasons given above I also disliked to use ether or chloroform, and accordingly used Schleich's fluid, which only answered moderately well,

dulling the pain but not annulling it. He felt pain not only during the incision of the abdominal wall, but also when the colon was handled. Instead of a glass bar I sewed the skin together by two stitches as suggested by Bidwell (*vide supra*). On the second day after the operation the bowel was opened through half its circumference, and on the ninth day was completely divided. He had no rise of temperature after the operation. I have not heard from him since.

Case XXIII.—*Cancer of rectum. Palliative colostomy by Maydl's method only, on account of the condition of the blood. Schleich's fluid used instead of ether. Relief; recovery from operation. Death thirty-seven days later from gangrene of foot from femoral venous thrombosis.*

Mrs. C. E., Stroudsburg, Pa., aged forty-three, was kindly brought to me by Dr. B. F. Keller of Pottstown, Pa., and Dr. C. M. Brownell of Stroudsburg, October 14, 1895. Her mother died of cancer and her grandmother of a tumor presumably malignant. In the middle of July, 1895, she noticed a sore feeling low down in the back, and that it hurt her to sit down. Her passages lessened in amount, but increased in frequency to two or three times a day. The size of the fecal masses also was diminished. There was a slight mucous discharge from the anus. Rectal touch showed the rectum to be entirely surrounded by an extensive cancerous mass at two and a half to three inches above the anus. The finger could be engaged within the mass, but I was uncertain whether it reached its upper edge. No adhesions seemed to exist either to the uterus, vagina,

or sacrum. Her general health seemed quite good, and I recommended extirpation. On November 7, 1895, she came down to my hospital, but with a marked change in her condition. Her lips and fingers were blue and livid, though there was no cardiac disease. Both legs were much swollen, and on examination I found a large thrombus in the right femoral vein and a moderate one in the left. In view, therefore, of the state of her blood, which became thrombosed with such ease, I instantly decided against any radical operation, and recommended a Maydl operation by a local anesthetic with Schleich's fluid.

Operation November 9, 1895. Two ounces of the medium solution of Schleich were injected under the skin and then into the muscular tissues of the abdominal wall. The operation was attended by no pain excepting at the upper end of the incision for perhaps a quarter of an inch, where I got beyond the area of the anesthesia. No pain was manifested on manipulating the colon (none of the fluid had reached the abdominal cavity or contents), and the operation was completed without difficulty, the bowel being stitched to the abdominal wall at the upper and lower margins by one suture. Two days afterward the bowel was opened with the scissors without pain or bleeding. On the fifth day the protruding part of the colon was cut away, so that the end projected only half an inch above the level of the skin. On the evening of that day she was suddenly seized with great pain in the right leg, which became pale and cold, evidently from a marked extension of the thrombus. The temperature

rose to 102°. The leg was elevated, wrapped in flannel and cotton, and surrounded with hot fomentations and hot-water bags. Internally hot stimulants and tonics were administered. In four days the temperature had fallen to the normal, and she went home ten days after the operation. Shortly after leaving the hospital gangrene of the left foot set in, and she died December 16, 1895, thirty-seven days after the Maydl operation.

Through the courtesy of Dr. Wm. J. Taylor I append two other cases in which the palliative Maydl operation gave great relief: the one for a short time before death; in the other the patient's life was prolonged for three years.

Case XXIV.—*Inoperable carcinoma of the bowel. Inguinal colostomy (Maydl's operation); great relief. Death two months later.*

Mr. P., Philadelphia, was first seen by me in consultation with Dr. Willard on May 21, 1895. For a long time he had been suffering with, as he supposed, hemorrhoids, but which proved eventually to be carcinoma of the rectum. When Dr. Willard first saw him it had gone beyond the point of successful operation, and accordingly, on May 22d, he curetted the growth in the rectum in order to overcome the obstruction, which was pronounced and painful. Following this, on several occasions I learned that curetting was done, each time with relief, the degree of which gradually lessened with the progress of the disease. In the summer of 1896, while at the seashore he came under the professional care of Dr. Wm. J. Taylor, who on September 1 did a Maydl operation in the

left inguinal region, after which he made a very speedy and satisfactory operative recovery. The bowel was opened after fourteen hours. After he returned to the city I saw him on several occasions. The relief from the operation was very great. His strength gradually failed, and he died on November 6, 1896.

CASE XXV.—*Inoperable cancer of rectum. Inguinal colostomy (Maydl's method); great relief for three years till he died.*

Rev. Mr. D., aged sixty-six, had been treated for hemorrhoids for several years. For fifteen months past the stools had been streaked with blood. A very extensive cancerous growth in the rectum was discovered by touch on his first visit, October 15, 1892.

Operation October 19, 1892, by Dr. Wm. J. Taylor. He took ether with very great difficulty and required artificial respiration during the operation, which was rapidly performed. Several hard cancerous nodules were found in the descending colon. The bowel was opened on the seventh day by the cautery. He made a prompt and satisfactory recovery. No radical operation, of course, was attempted. Two years after the colostomy his general health was good, and he reported "not much trouble from the wounds." He died September 29, 1895, almost three years after the operation. Some time before his death the cancer, which had extended to the bladder, resulted in a recto-vesical fistula.